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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,044	04/20/2001	Katherine H. Cornog	A01004	3631

26643 7590 06/16/2006

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EXAMINER
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EDWARDS, PATRICK L

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/839,044	Applicant(s) CORN OG ET AL.	
	Examiner Patrick L. Edwards	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 17-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

Art Unit: 2624

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04-10-2006 has been entered.

### ***Response to Arguments***

2. Applicant's arguments filed on 04-10-2006 have been fully considered. A response to these arguments is provided below.

## **Prior Art Rejections**

### **Summary of Argument:**

(a) Applicant alleges that the "optical flow" in Sasaki is not based on an "optical flow constraint equation." Applicant points to Sasaki col. 4 lines 49-50 and states that the optical flow in Sasaki is "merely a computation of a speed vector."

### **response:**

The examiner disagrees. Optical flow is a well-established term that is based on a well established method. Further, the fact that optical flow is a computation of a speed vector should be news to no one. The computation of Marshall's optical flow is also a computation of a "speed vector" (see applicant's arguments, pg. 3, 2<sup>nd</sup> paragraph—which states that the computation of a speed vector is the only similarity between the optical flow methods of Sasaki and Marshall. While reading this, keep in mind that it appears only two paragraphs before applicant states that "[I]n Sasaki, 'optical flow' is merely a computation of a 'speed vector' .").

Applicant's arguments hinge on the fact that Sasaki does not list out the optical flow constraint equation, but this is the exact reason that the examiner cited to the Marshall reference—to show that "optical flow" necessarily requires such a calculation. This is still true. The constraint equation is inherent in an optical flow calculation. There is a lot of literature on optical flow, and—probably to promote brevity and eliminate redundancy—most of the authors of this literature do not start from scratch and derive the "optical flow constraint equation" in all of their technical papers and/or patent applications. The reference that was cited to explain optical flow was cited because it *explains* optical flow. It explains how optical flow works, and from that, we know that any optical flow method necessarily requires those elements.

Art Unit: 2624

*Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 8, 9, 17, and 18-20 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Sasaki et al. (USPN 6,246,961).

Regarding claims 1, 2, and 17, Sasaki discloses generating a single channel image for each of two input images according to a function that measures, for each pixel, occurrence of a desired characteristic, other than luminance alone, in the input images at each pixel location to provide a value for an output pixel in the single channel image from a range of values that represent a likelihood of the occurrence of the desired characteristic (Sasaki col. 8 lines 29-46: The reference describes generating two edge images (i.e. single channel images) which correspond to two input images. Edge images measure the likelihood of an edge (i.e. a desired characteristic)).

Sasaki further discloses computing an estimate of motion of the desired characteristic between the two images using a gradient based method using the single channel images generated for the two input images and using as a constraint that a total of the desired characteristic is constant from one image to the next (Sasaki col. 8 lines 29-46: The reference describes detecting optical flow (i.e. a gradient based motion estimation method) between the two edge images (i.e. the single channel images). As is well known in the art—and stated throughout applicant's own disclosure—the optical flow calculation uses a constant constraint between two images. Since these two images represent the desired characteristic, the claim limitation is met. This is confirmed by applicant's own disclosure in several instances (see e.g. at paragraph [0003] and [0045]).

Regarding claim 19, this claim does not appear to further limit claim 1. Accordingly, the Sasaki reference anticipates this claim.

Regarding claims 8, 9, 18, and 20 Sasaki discloses an apparatus for performing the method of claim 1 (see figure 1).

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2624

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-6, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki as applied above, and further in view of Von Brandt (USPN 4,924,310).

Regarding claims 4 and 5, Sasaki discloses detecting a potential collision according to the estimate of motion, but fails to expressly disclose using the motion estimate to performing processing on the image such as interpolation between two images. Von Brandt, however, discloses using a motion estimate to interpolate between two images (Von Brandt col. 1 lines 40-54). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Sasaki's motion estimation method by using the estimate to interpolate between two images as taught by Von Brandt. Such a modification would have allowed for the reconstruction of missing image frames (Von Brandt col. 1 lines 40-42).

Regarding claim 6, Sasaki discloses that the desired characteristic is edge magnitude. This limitation was discussed in the 102 rejection.

Regarding claims 11-13, Sasaki disclose an apparatus for performing the method (see figure 1).

7. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Sasaki as applied above, and further in view of Kobilansky (U.S. Pat. Pub. No. US2002/0159749 A1).

Regarding claim 3, Sasaki discloses a desired characteristic, but fails to expressly disclose that this desired characteristic is proximity to a color. Kobilansky, in the same field of endeavor of image processing and the same problem solving area of motion estimation, discloses a motion estimation technique that takes into account the proximity to a color (see paragraph [0015]: The reference describes that a region in the target frame should have a color close (i.e. proximity to a color) to the same region in the reference frame.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Sasaki by having the desired characteristic as proximity to a color as taught in Kobilansky because the use of such a desired characteristic "provides enhancements to the process of estimating motion in image-sequences such as those that originate from motion pictures or television video" (see Kobilansky: paragraph [0004]).

Regarding claim 10, Sasaki discloses an apparatus for performing the method (see figure 1.)

8. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Sasaki and Von Brandt as applied above, and further in view of Kobilansky (U.S. Pat. Pub. No. US2002/0159749 A1). The arguments as to the relevance of Sasaki and Von Brandt (and Kobilansky) as applied above are incorporated herein. The limitations of the claim and the motivation to combine references have been discussed in the above two paragraphs. A separate paragraph was required for these two claims because of the different dependency.

Art Unit: 2624

*Conclusion*

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L. Edwards whose telephone number is (571) 272-7390. The examiner can normally be reached on 8:30am - 5:00pm M-F.

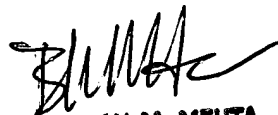
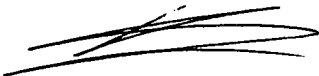
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patrick L. Edwards

Art Unit 2624

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